PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room
CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 14 June 2001 (14.06.01)	
International application No. PCT/GR00/00013	**Applicant's or agent's file reference** PANAGIOTIDOU
International filing date (day/month/year) 07 March 2000 (07.03.00)	**Priority date** (day/month/year) 09 November 1999 (09.11.99)
Applicant NIKOLAOU, Athanasios	

1. The designated Office is hereby notified of its election made:

 [X] in the demand filed with the International Preliminary Examining Authority on:

 12 April 2001 (12.04.01)

 [] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

 [] was not

 made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Claudio Borton
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

ARGYRIADIS, Korinna
Sina Str. 14
GR-10672 Athens
GRÈCE

Date of mailing (day/month/year)
07 décembre 2001 (07.12.01)

Applicant's or agent's file reference
PANAGIOTIDOU

IMPORTANT NOTIFICATION

International application No.
PCT/GR00/00013

International filing date (day/month/year)
07 mars 2000 (07.03.00)

1. The following indications appeared on record concerning:

[] the applicant [] the inventor [X] the agent [] the common representative

Name and Address
PANAGIOTIDOU, Effimia
41 Mitropoleos
GR-546 23 Thessaloniki
Greece

State of Nationality:
State of Residence:
Telephone No.: 0030-31-241880
Facsimile No.: 0030-31-225275
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[X] the person [X] the name [X] the address [] the nationality [] the residence

Name and Address
ARGYRIADIS, Korinna
Sina Str. 14
GR-10672 Athens
Greece

State of Nationality:
State of Residence:
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[] the International Searching Authority
[X] the International Preliminary Examining Authority
[] the designated Offices concerned
[X] the elected Offices concerned
[] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Athina NICKITAS-ETIENNE
Telephone No.: (41-22) 338.83.38

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty

For receiving Office use only

International Application No PCT/GR 00/00013

International Filing Date 07.03.2000

PCT INTERNATIONAL APPLICATION
ΔΙΕΘΝΕΣ ΑΙΤΗΣΗ

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference (if desired - 12 characters maximum) PANAGIOTIDOU

Box No. I TITLE OF INVENTION

METHOD FOR THE QUALITATIVE IMPROVEMENT OF THE REFINED PRODUCTS OF CRUDE OIL

Box No. II APPLICANT

Name and address (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.*)

NIKOLAOU ATHANASIOS of PANAGIOTIS
8 EVROU
19100 MEGARA ATTIKIS
ATHENS - GREECE

☒ This person is also inventor

Telephone No
0030-296-82755

Facsimile No

Teleprinter No

State (*that is, country*) of nationality
GR

State (*that is, country*) of residence
GR

This person is applicant for the purposes of ☒ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.*)

This person is
☐ applicant only
☐ applicant and inventor
☐ inventor only (*If this check-box is marked, do not fill in below.*)

State (*that is, country*) of nationality

State (*that is, country*) of residence

This person is applicant for the purposes of ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet

Box No. IV AGENT OR COMMON REPRESENTATIVE, OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby has been appointed to act on behalf of the applicant(s) before the competent International Authorities as ☒ agent ☐ common representative

Name and address: (*Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.*)

PANAGIOTIDOU EFFIMIA
ATTORNEY AT LAW
(No of Reg. at the EPO: 155600)
41 MITROPOLEOS
546 23 THESSALONIKI - GREECE

Telephone No
0030-31-241880

Facsimile No
0030-31-225275

Teleprinter No

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent

PCT/GR00/00013

Box No V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- [x] AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- [x] EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- [] EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- [x] OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (*if other kind of protection or treatment desired, specify on dotted line*)

National Patent (*if other kind of protection or treatment desired, specify on dotted line*)

- [x] AE United Arab Emirates
- [x] AL Albania
- [] AM Armenia
- [] AT Austria
- [x] AU Australia
- [] AZ Azerbaijan
- [x] BA Bosnia and Herzegovina
- [x] BB Barbados
- [x] BG Bulgaria
- [x] BR Brazil
- [] BY Belarus
- [x] CA Canada
- [] CH and LI Switzerland and Liechtenstein
- [x] CN China
- [x] CR Costa Rica
- [x] CU Cuba
- [x] CZ Czech Republic
- [] DE Germany
- [] DK Denmark
- [x] DM Dominica
- [x] EE Estonia
- [] ES Spain
- [] FI Finland
- [] GB United Kingdom
- [x] GD Grenada
- [x] GE Georgia
- [] GH Ghana
- [] GM Gambia
- [x] HR Croatia
- [x] HU Hungary
- [x] ID Indonesia
- [x] IL Israel
- [x] IN India
- [x] IS Iceland
- [x] JP Japan
- [] KE Kenya
- [] KG Kyrgyzstan
- [x] KP Democratic People's Republic of Korea
- [x] KR Republic of Korea
- [] KZ Kazakhstan
- [x] LC Saint Lucia
- [x] LK Sri Lanka
- [x] LR Liberia
- [] LS Lesotho
- [x] LT Lithuania
- [] LU Luxembourg
- [x] LV Latvia
- [x] MA Morocco
- [] MD Republic of Moldova
- [x] MG Madagascar
- [x] MK The former Yugoslav Republic of Macedonia
- [x] MN Mongolia
- [] MW Malawi
- [x] MX Mexico
- [x] NO Norway
- [x] NZ New Zealand
- [x] PL Poland
- [] PT Portugal
- [x] RO Romania
- [] RU Russian Federation
- [] SD Sudan
- [] SE Sweden
- [x] SG Singapore
- [x] SI Slovenia
- [x] SK Slovakia
- [] SL Sierra Leone
- [] TJ Tajikistan
- [] TM Turkmenistan
- [x] TR Turkey
- [x] TT Trinidad and Tobago
- [] TZ United Republic of Tanzania
- [x] UA Ukraine
- [] UG Uganda
- [x] US United States of America
- [x] UZ Uzbekistan
- [x] VN Viet Nam
- [x] YU Yugoslavia
- [x] ZA South Africa
- [] ZW Zimbabwe

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- []
- []

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (*Confirmation (including fees) must reach the receiving Office within the 15-month time limit.*)

PCT/GR00/00013

Box No. VI PRIORITY CLAIM

☐ Further priority claims are indicated in the Supplemental Box

Filing date of earlier application (day month year)	Number of earlier application	Where earlier application is: national application: country	regional application: regional Office	international application: receiving Office
Item 1: 9 NOVEMBER 1999 (09.11.99)	99600021.2		EPO	
Item 2:				
Item 3:				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (*only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office*) identified above as item(s)

* If the earlier application is an ARIPO application, at least one country must be indicated in which the earlier application was filed (Rule 4.10(b)(ii)). If the earlier application is a national application for a State party to the European Patent Convention and the European Patent Organization, at least one country must be indicated in which the earlier application was filed (Rule 4.10(b)(iii)). If the earlier application is a regional application, at least one country party to the regional patent treaty must be indicated in which the earlier application was filed (Rule 4.10(b)(iv)). If the earlier application is an international application, at least one country must be indicated in which the earlier application was filed (Rule 4.10(b)(v)). If the earlier application is a national application for a State party to the European Patent Convention and the European Patent Organization, at least one country must be indicated in which the earlier application was filed (Rule 4.10(b)(iii)). If the earlier application is a regional application, at least one country party to the regional patent treaty must be indicated in which the earlier application was filed (Rule 4.10(b)(iv)). If the earlier application is an international application, at least one country must be indicated in which the earlier application was filed (Rule 4.10(b)(v)).

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) If two or more International Searching Authorities are competent to carry out the international search, indicate the one which is chosen (the two-letter code may be used):

ISA EP

Request to use results of earlier search; reference to that search (If an earlier search has been carried out by or requested from the International Searching Authority)

Date (day month year) Number Country (or regional Office)

Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:

request	3
description (excluding sequence listing part)	7
claims	7
abstract	1
drawings	1
sequence listing part of description	
Total number of sheets	19

This international application is accompanied by the item(s) marked below:

1 ☒ fee calculation sheet
2 ☒ separate signed power of attorney
3 ☐ copy of general power of attorney; reference number, if any:
4 ☐ statement explaining lack of signature
5 ☐ priority document(s) identified in Box No. VI as item(s)
6 ☐ translation of international application into (language):
7 ☐ separate indications concerning deposited microorganism or other biological material
8 ☐ nucleotide and/or amino acid sequence listing in computer readable form
9 ☐ other (*specify*):

Figure of the drawings which should accompany the abstract: 1

Language of filing of the international application: ENGLISH

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request)

PANAGIOTIDOU EFFIMIA,
ATTORNEY AT LAW
(No of Reg. at the EPO: 155600)
41 MITROPOLEOS
546 23 THESSALONIKI
GREECE

For receiving Office use only

1 Date of actual receipt of the purported international application	07 . 03 . 2000	2 Drawings: ☒ received ☐ not received
3 Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application		
4 Date of timely receipt of the required corrections under PCT Article 11(2)		
5 International Searching Authority (if two or more are competent) ISA / EPO	6 ☐ Transmittal of search copy delayed until search fee is paid	

For International Bureau use only

Date of receipt of the record copy by the International Bureau

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GR 00/00013

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C10G32/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C10G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 625 178 A (ROJEY ALEXANDRE) 29 April 1997 (1997-04-29) the whole document	1-13
A	EP 0 435 590 A (EXXON RESEARCH ENGINEERING CO) 3 July 1991 (1991-07-03) the whole document	1-13
A	US 5 055 180 A (KLAILA WILLIAM J) 8 October 1991 (1991-10-08) the whole document	1-13
P,A	WO 00 11135 A (NIKOLAOU ATHANASIOS) 2 March 2000 (2000-03-02) the whole document	1-13

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 May 2000	17/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Michiels, P

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte onal Application No
PCT/GR 00/00013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5625178 A	29-04-1997	FR 2726485 A	10-05-1996
		BR 9505123 A	09-09-1997
		CA 2162325 A	09-05-1996
		GB 2294885 A,B	15-05-1996
		IT MI952295 A	08-05-1996
		NL 1001588 C	12-09-1996
		NL 1001588 A	11-07-1996
		NO 954470 A	09-05-1996
EP 0435590 A	03-07-1991	US 5181998 A	26-01-1993
		CA 2031958 A	28-06-1991
		JP 3291244 A	20-12-1991
		US 5328577 A	12-07-1994
US 5055180 A	08-10-1991	AT 70079 T	15-12-1991
		AU 586820 B	27-07-1989
		AU 4237485 A	15-11-1985
		BR 8506617 A	15-04-1986
		CA 1261735 A	26-09-1989
		DE 3584819 A	16-01-1992
		EP 0180619 A	14-05-1986
		EP 0307003 A	15-03-1989
		JP 61501931 T	04-09-1986
		KR 8903463 B	21-09-1989
		MX 159060 A	13-04-1989
		NO 855178 A	13-02-1986
		NO 864023 A	13-02-1986
		NO 864024 A	13-02-1986
		NO 864025 A	13-02-1986
		NO 864026 A	13-02-1986
		WO 8504893 A	07-11-1985
		ZA 8502948 A	24-12-1985
WO 0011135 A	02-03-2000	EP 0987323 A	22-03-2000

M

PATENT COOPERATION TREATY

PCT

REC'D 01 FEB 2002
WIPO PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PANAGIOTIDOU		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GR00/00013	07/03/2000	09/11/1999
International Patent Classification (IPC) or national classification and IPC C10G32/02		
Applicant NIKOLAOU ATHANASIOS OF PANAGIOTIS		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

 ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

 - I ☒ Basis of the report
 - II ☐ Priority
 - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12/04/2001	30.01.2002
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Pielka, I Telephone No. +49 89 2399 8357

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GR00/00013

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-7	as originally filed				

Claims, No.:

1-13	as received on	12/11/2001	with letter of	12/11/2001	

Drawings, sheets:

1/1	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

 These elements were available or furnished to this Authority in the following language: , which is:

 ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 ☐ the language of publication of the international application (under Rule 48.3(b)).
 ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

 ☐ contained in the international application in written form.
 ☐ filed together with the international application in computer readable form.
 ☐ furnished subsequently to this Authority in written form.
 ☐ furnished subsequently to this Authority in computer readable form.
 ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

 ☐ the description, pages:
 ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)
see separate sheet

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 2-10,12-13.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 2-10, 12-13 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims

	No:	Claims	1-13
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-13
Industrial applicability (IA)	Yes:	Claims	1-13
	No:	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item I

Basis of the report

1. The new features of amended claims 1 to 5 have no support in the application as filed so that they constitute added subject-matter. For example in claim 1 the expression "comprising its chronic interruption and/or change of its power output from maximum to zero" has no basis in the application as filed. Similarly in claim 2 the expression "symmetrical and/or asymmetrical" has no basis. In claim 3 the features of time ranges such a 1 picosecond to 20 seconds have no basis. In claims 4 and 5 the range of 30 Hz to 300 GHz has no basis.
 The claims 1 to 5 do not meet the requirements of **Article 19(2) PCT**.

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The subject-matter of the dependent claims 2 to 13 is drafted in such broad terms that no technical limitation can be ascertained. For example, in claim 2 the expression "symmetrical and/or asymmetrical" leaves entirely open what is expected. Similarly in claims 6 and 7 "predetermined and/or not determined" leaves it entirely open as to what is being claimed. Thus it is unclear what subject-matter is being claimed since nothing is defined.
 In claim 13 the claim relates to the use of a method. This is unclear as a use claim is in its strictest sense is in fact a method claim.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Novelty

1. Claim 1 relates to a method of qualitative improvement of the refined products of crude oil through the use of electromagnetic waves, whereby the electromagnetic radiation is pulsed.

 The expression "qualitative improvement" is considered to be vague and unclear so that no technical limitation can be inferred from this expression. The expression "to reduce the harmful biological consequences.." is a desired result and

introduces no limitation.

The claimed subject-matter is not novel in view of the following document cited in the Search Report, notably; EP-A-0 435 590, or D2.
D2 discloses the upgrading of hydrocarbons such as crude oil and its products using electromagnetic radiation which is pulsed microwave energy (see claims 1 and 12 as well as column 2, lines 30 to 34).

Thus claim 1 does not meet the requirements of **Article 33(2) PCT**.

2. Claims 2 to 13 depend on claim 1 which does not meet the requirements of **Article 33(2) PCT** so that dependent claims 2 to 13 also do not meet the requirements of **Article 33(2) PCT**.

Inventive Step

1. The claimed subject-matter does not appear to involve an inventive step as it is not apparent from the description what problem is solved, there being no experimental evidence which shows that any "qualitative improvement", whatever that may be, is achieved.
The claims 1 to 13 do not meet the requirements of **Article 33(3) PCT**.

Re Item VIII

Certain observations on the international application

1. The application is considered to be unclear so that the requirements of **Articles 5 and 6 PCT** are not met.

The application is directed to the reduction of the harmful effects caused by the use of crude oil and its products to the environment. The crude oil product are not in any way defined so that any possible product is encompassed within the teaching of the application. It is not taught which electromagnetic radiation or which wavelength is suitable for which products. Considering the plethora of possible products, for example ethylene, gasoline and plastics, the application does not provide any technical information which could instruct the reader how to perform the method. The application contains no examples and no technical data how to carry out the alleged invention. The use of terms such as "qualitative

improvement", which are so broad and undefined, means that it is unclear what the application aims to achieve.

2. As already indicated above under Item (V), the subject-matter of the dependent claims is considered to be unclear owing to the expressions "and/or".

CLAIMS

1. A method of qualitative improvement of the refined products of crude oil (1), through the use of electromagnetic waves (6), to reduce the harmful biological consequences of the use of these products, characterized by the fact, that the volume of the refined products of crude oil (1) receives electromagnetic energy from a synthetic electromagnetic emission covering wide ranges of frequencies, comprising a determined and/or not determined multitude of independent electromagnetic waves emissions (6) of different attribute frequency value, and is produced by electronic and/or electromechanical devices (3), each independent emission and/or the synthetic emission as a whole operating non-continuously, but in a way comprising its chronic interruption and/or the change of its power output from maximum to zero using any form of pulses.

2. A method according to claim 1, characterized by the fact, that each independent emission of electromagnetic waves with attribute frequency values and/or the synthetic emission, which in its entirety consists of a multitude of emissions of electromagnetic waves with different attribute frequency value (6), operates with symmetrical and/or asymmetrical duration of interruption and operation time and with any kind of composition of symmetrical and/or asymmetrical duration of interruption and operation time and any form of pulse for periodical power output change of each independent and/or synthetic emission.

3. A method according to claims 1 and 2, characterized by the fact, that the interruption duration of each independent and/or the synthetic emission may have any value from 1 picosecond to 20 seconds, preferably 1 μsec to 2 seconds at the most, and the duration of operation of each independent and/or the synthetic emission may have any value from 1 femptosecond to 5 seconds, preferably 1 μsec to 0,5 seconds at the most.

4. A method according to claims 1, 2 and 3, characterized by the fact, that the independent emissions of different frequencies of electromagnetic waves (6) have each different and/or the same power and cover a wide range or ranges or the entire widest range of electromagnetic spectrum frequencies from 30 Hz up to 300 GHz, so that the emitted impulse excitation activity of each independent electromagnetic waves emission with attribute frequency value coincides suitably with the natural pulsing frequency of each atomic and/or molecular system of the refined products of crude oil elements creating resonance circumstance.

5. A method according to claims 1 to 4, characterized by the fact, that independent emissions of different electromagnetic waves frequencies (6), with any attribute frequency value created in the widest range of electromagnetic spectrum frequencies from 30 Hz up to 300 GHz. are emitted towards the volume of the refined products of crude oil (1), preferably in the wide range of electromagnetic spectrum frequencies from 30 Hz up to 50 GHz.

6. A method according to claims 1 to 5, characterized by the fact, that appliance of the method is carried out by at least one device emitting a predetermined and/or not determined multitude of independent emissions of different electromagnetic waves frequencies (6) when in operation.

7. A method according to claims 1 to 5, characterized by the fact, that appliance of the method is carried out by more than one devices emitting each a predetermined and/or not determined multitude of independent emissions of different electromagnetic waves frequencies (6) when in operation, wherein each device emitts a predetermined and/or not determined multitude of electromagnetic waves (6) emissions

Empfangs...

of essentially different and/or essentially identical frequencies as the other devices.

8. A method according to claims 1 to 7, characterized by the fact, that the synthetic emission consisting of a multitude of independent emissions of different electromagnetic waves frequencies (6) of different and/or identical frequencies as a total as well as each independent emission of electromagnetic waves with specific attribute frequency value may be also modulated by any kind of modulating type.

9. A method according to claims 1 to 8, characterized by the fact, that it is also applied by the essentially simultaneous or not operation of more than one devices emitting a predetermined and/or not determined multitude of independent electromagnetic waves (6) emissions of different frequencies in the same place, where each one emitts electromagnetic energy of the same and/or different power.

10. A method according to claims 1 to 9, characterized by the fact, that the total of power emitted towards the refined products of crude oil (1) must bring about the desired result remaining at low levels, so that no significant increase of temperature occurs in the refined products of crude oil to which the method is applied, either by using one or more devices.

11. A method according to claims 1 to 10, characterized by the fact, that the duration of its application depends on the kind of refined products of crude oil (1) on which it is applied, and that the duration of said application is in proportion to the desired qualitative improvement, so that the longer the duration of application the greater the qualitative improvement of the refined products of crude oil on which application takes place.

12. A method according to claims 1 to 11, characterized by the fact, that it is applied to the final refined products of crude oil or not (1), which may be either at some stage of production, or after completion of their production, or while storage and with any way or material of packaging, even if any material is interposed between the electromagnetic energy emission source and the refined products of crude oil with the exception of conductible materials which are grounded.

13. The use of the method according to claims 1 to 12, characterized by the fact, that it can be used broadly in industry, manufacturing and commercial enterprises of refined products of crude oil production and/or distribution and resell.

22134

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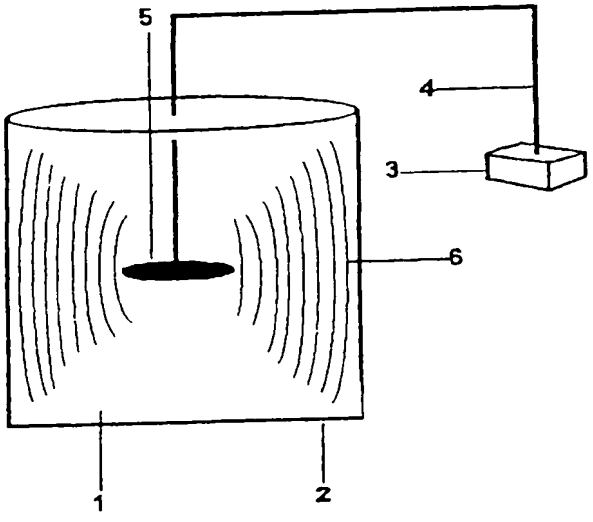
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Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette

(54) Title: METHOD FOR THE QUALITATIVE IMPROVEMENT OF THE REFINED PRODUCTS OF CRUDE OIL



(57) Abstract: The method belongs to the field of electronic science. It is applied to generally all the refined products of crude oil, liquid or gaseous. The qualitative improvement is achieved with the pulsatory emission of electromagnetic waves (6) towards the products of crude oil, which are produced by electromechanical or electronic devices (3), are pre-programmed, cover wide ranges of wavelengths from 1 mm to 11,000 Km, together with their harmonic frequencies, which are produced by the device and which are emitted either at all wavelengths from 1 mm to 11,000 Km, or at one or more parts of particular areas, with controlled potency, controlled application time and controlled application result. It is applied in industries and commercial enterprises of products of crude oil. It can also be applied during the ground, marine or air transportation of the products.

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The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below

IPEA/ EPO

22134

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA	Date of receipt of DEMAND

Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION

Applicant's or agent's file reference: PANAGIOTIDOU E.

International application No	International filing date *(day/month/year)*	(Earliest) Priority date *(day/month/year)*
PCT/GR00/00013	07.03.2000	09.11.1999

Title of invention:
METHOD FOR THE QUALITATIVE IMPROVEMENT OF THE REFINED PRODUCTS OF CRUDE OIL.

Box No. II APPLICANT(S)

Name and address *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

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ATHENS - GREECE

Telephone No.: 0030-296-82755
Facsimile No.:
Teleprinter No.:

State *(that is, country)* of nationality:	State *(that is, country)* of residence:
GR	GR

Name and address *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:	State *(that is, country)* of residence:

Name and address *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:	State *(that is, country)* of residence:

☐ Further applicants are indicated on a continuation sheet.

International application No
PCT/GR00/00013

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is [x] agent [] common representative

and [x] has been appointed earlier and represents the applicant(s) also for international preliminary examination

[] is hereby appointed and any earlier appointment of (an) agent(s) common representative is hereby revoked.

[] is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s) common representative appointed earlier

Name and address *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

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0030-31-225275

Teleprinter No

[] **Address for correspondence**: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special addr ess to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments: *

1 The applicant wishes the international preliminary examination **to start on the basis of:**

[x] the international application as originally filed

the description
[x] as originally filed
[] as amended under Article 34

the claims
[x] as originally filed
[] as amended under Article 19 (together with any accompanying statement)
[] as amended under Article 34

the drawings
[x] as originally filed
[] as amended under Article 34

2 [] The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3 [] The applicant wishes the start of the international preliminary examination **to be postponed** until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69 1(d)) *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: ENGLISH

[x] which is the language in which the international application was filed.
[] which is the language of a translation furnished for the purposes of international search.
[] which is the language of publication of the international application.
[] which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby **elects all eligible States** *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes **not to elect:**

See Notes to the demand form

International application No.
PCT/GR00/00013

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination		For International Preliminary Examining Authority use only: received	not received
1 translation of international application	sheets	☐	☐
2 amendments under Article 34	sheets	☐	☐
3 copy (or, where required, translation) of amendments under Article 19	sheets	☐	☐
4 copy (or, where required, translation) of statement under Article 19	sheets	☐	☐
5 letter 1	sheets	☐	☐
6 other *(specify)*	sheets	☐	☐

The demand is also accompanied by the item(s) marked below:

1 [X] fee calculation sheet
2 [X] separate signed power of attorney
3 [] copy of general power of attorney, reference number, if any
4 [] statement explaining lack of signature
5 [] nucleotide and or amino acid sequence listing in computer readable form
6 [X] other *(specify)*: Bank deposit copy

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand)

PANAGIOTIDOU Efimia
ATTORNEY AT LAW
(No of Reg. at the EPO: 1556000
MITROPOLEOS 41
546 23 THESSALONIKI
GREECE

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1 Date of actual receipt of DEMAND

2 Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b)

3 ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.

4 ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5

5 ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

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Demand received from IPEA on

PCT

POWER OF ATTORNEY

(for an international application filed under the Patent Cooperation Treaty)

(PCT Rule 90.4)

The undersigned applicant(s) *(Names should be indicated as they appear in the request)*:

NIKOLAOU Athanasios
8 EVROU
19100 MEGARA ATTIKIS
GREECE

hereby appoints (appoint) the following person as: ☒ agent ☐ common representative

Name and address
(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

PANAGIOTIDOU Effimia
ATTORNEY AT LAW
(No of Reg. at the EPO: 155600)
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546 23 THESSALONIKI
GREECE

to represent the undersigned before

☒ all the competent International Authorities
☐ the International Searching Authority only
☐ the International Preliminary Examining Authority only

in connection with the international application identified below:

Title of the invention: METHOD FOR THE QUALITATIVE IMPROVEMENT OF THE REFINED PRODUCTS OF CRUDE OIL.

Applicant's or agent's file reference:

International application number (if already available): PCT/GR00/00013

filed with the following Office EPO as receiving Office
and to make or receive payments on behalf of the undersigned.

Signature of the applicant(s) *(where there are several applicants, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading the request or this power)*:

NIKOLAOU Athanasios

Date: 2nd of APRIL 2001

Form PCT/Model of power of attorney (for a given international application) (July 1992)

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

PANAGIOTIDOU, Effimia
Mitropoleos 41
546 23 Thessaloniki
GREECE

NOTIFICATION OF RECEIPT OF DEMAND BY COMPETENT INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence and Administrative Instructions, Section 601(a))

Date of mailing *(day/month/year)*	15.05.01
Applicant's or agent's file reference: PANAGIOTIDOU	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GR 00/00013	07/03/2000	09/11/1999

Applicant

NIKOLAOU ATHANASIOS OF PANAGIOTIS

1. The applicant is hereby **notified** that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

12/04/2001

2. This date of receipt is:

- [X] the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- [] the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- [] the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. [] **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

[] *(If applicable)* This notification confirms the information given by telephone, facsimile transmission or in person on: _____

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. (+49-89) 2399-0, Tx: 523656 epmu d Fax: (+49-89) 2399-4465	MARRA E Tel. (+49-89) 2399-7235

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(71) Applicant and
(72) Inventor: **NIKOLAOU, Athanasios** [GR/GR]; 8 Evrou Str., GR-191 00 Megara Attikis (GR).

(74) Agent: **PANAGIOTIDOU, Effimia**; 41 Mitropoleos, GR-546 23 Thessaloniki (GR).

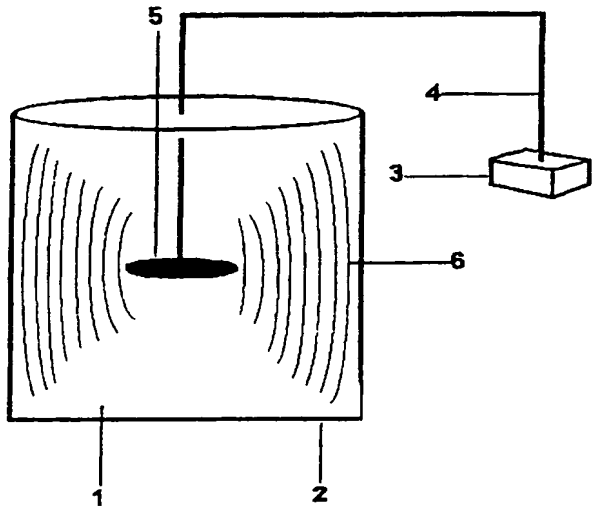
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(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

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(57) Abstract: The method belongs to the field of electronic science. It is applied to generally all the refined products of crude oil, liquid or gaseous. The qualitative improvement is achieved with the pulsatory emission of electromagnetic waves (6) towards the products of crude oil, which are produced by electromechanical or electronic devices (3), are pre-programmed, cover wide ranges of wavelengths from 1 mm to 11,000 Km, together with their harmonic frequencies, which are produced by the device and which are emitted either at all wavelengths from 1 mm to 11,000 Km, or at one or more parts of particular areas, with controlled potency, controlled application time and controlled application result. It is applied in industries and commercial enterprises of products of crude oil. It can also be applied during the ground, marine or air transportation of the products.

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Method for the qualitative improvement of the refined products of crude oil

The invention belongs in the field of electronic science and its applications in the field of the industrially manufactured products deriving from the refinement of all qualities of crude oil.

More specifically, the invention concerns the qualitative improvement of the products derived from the separation of oil, through the various processes of industrial production, such as petrol, motor oil, heating oil, paraffin, lubricants, kerosene, jet fuel, volatile gasses, tar, grease, wax, paint solvents, gasses in liquid or gaseous state such as propane and butane and, generally, all the fractions of crude oil, gas or liquid products.

The canalization to the environment of heavy metals, such as lead, arsenic, cadmium and mercury, caused by the burning of carbohydrates, pollutes and poisons daily the environment and leads slowly and steadily to ecological catastrophe. With regard to the problem of atmospheric pollution caused especially by the burning of petrol, in order to reinforce the antiknocking values of petrol, people initially used the addition of lead compounds to the final product of petrol. However, this technicque resulted in new pollution and additional damage to the environment.

Despite the strict legislative status in effect both in the European Union and in the USA, as well as in the other continents, and despite the International Treaties signed and ratified at various times by almost all the nations on the planet, the pollution of the atmosphere, then of the hydrosphere, next of the lithosphere and, finally, of the biosphere, is the most serious problem contemporary human civilization faces.

The research to counter and contain the pollution of the atmosphere was aimed mainly at the improvement of the quality of the petrol during the stage of its

production. Thus, for its improvement are used the methods of pyrolysis and hydro-pyrolysis, as well as the process of reclamation where the reactions of isomerism and alkyliosis take place. All these methods lead to the production of a better quality petrol. According, then, to the state-of-the-art technology, the unleaded petrol is considered the best, qualitatively, fuel and the less harmful to the environment.

With regard to countering the problem of the pollution of the atmosphere caused especially by lubricants, for the improvement of their quality, according to the state-of-the-art technology, several methods are used, such as the distillation of the oils using reduced pressure on the residue of the first distillation, which in turn are submitted to further processing for the removal of unwanted compounds, such as the asphaltic and the aromatic compounds, etc. Also, for their improvement, additives are used.

To-date there exists no method or product which is applied on the products of crude oil and acts on the toxic substances these contain, limiting satisfactorily their toxic action and upgrading their quality to a great extent, regardless of the production stage in which they are, and which is particularly applied before the use of the product, that is, before the product reaches the final consumer.

The aim of the present invention is to bring a solution to the above-mentioned problem of the reduction of the harmful effects caused by the use of the products of crude oil, to the atmosphere, the hydrosphere, the lithosphere and the biosphere. The present method applies to all the products of all qualities of crude oil. This means: The products which are sent from the refineries directly to the final user, as well as the products which, after their production in the refineries, are forwarded to processing industries for further processing. It also applies to the products which, after their processing in the processing industries, are forwarded to the final user. In addition, the present method can also apply to the final

products, in the storage areas of the gas stations, as well as to the final products even after their packaging, immediately before they are sent for consumption (like, for example, petrol or oil tanks, drums of motor oil or heating oil.) Finally, it also applies to the products transported by boat, container, tanker, etc.

The method, applied to the refined products of crude oil, acting on the toxic substances they contain, purifies and balances their chemical compounds, improving them qualitatively, so that the final product used by the consumer produces fewer toxic substances. It constitutes a new, original method of qualitative improvement of all the refined products of crude oil. The qualitative improvement is achieved with the emission towards the products of crude oil of electromagnetic waves covering wide wavelengths, which are produced by electromechanicalal or electronic devices, the emission of which is pre-programmed, has controlled power, control application time and control quality result.

Therefore, the main advantage of the present method is that, in whatever stage of the processing of the products the method is applied, whether immediately after the products leave the refinery or after the products leave the processing industries, it reduces the toxic substances contained in them, which has as a result that when the products reach the market, they are already products of improved quality and, consequently, when they burn they produce less pollution and so damage the environment a lot less.

An extremely serious advantage of this method is that the beginning of the improvement is achieved with the beginning of the application of the method, while its required application time for the achievement of substantial improvement is short, not more than a few hours. Another advantage of this method is that it admits wide industrial application and, moreover, it does not require changes in the

working specifications of the existing industrial or manufacturing facilities, either during the stage of the refining of the crude oil and its products or during the stage of the creation of the final product which is, after selection, ready to be sent to the market. Another advantage of this method is that it is not applied only at the processing stage of the crude oil and its final products but also directly on the final product, even after its packaging (oil tanks, petrol and oil containers, etc..) or while it is in storage areas such as refineries or gas stations reservoirs. Another advantage of this method is that for its application it is not necessary for the products of crude oil to be stationary, nor for the device used for the application of the method. Thus, the method can be applied inside ships or transport containers, so as to achieve the qualitative improvement of the products in the time that traspires from their loading on the ships or the containers until their arrival in their destination points. Another advantage of this method is that it is financially expedient, as it requires very low operational costs, not to mention the fact that the labour cost required for the application of the method is virtually non-existent.

The invention is described below, with the aid of non-restrictive examples and with reference to the attached drawing, which illustrates one application form of the method which constitutes the object of the present invention.

The drawing illustrates one application way of the invention, on final or not products of crude oil and in packaged final products.

One application way of the invention is desribed with reference to the drawing. The products of crude oil (1) are placed in the customary storage areas (2) (reservoirs), or packaged in the customary way (tanks), or are ready for transportation (ships, tankers, etc.) at the customary temperature. Near them is placed an electromechanical or electronic device (3) of programmed operation, which emits electromagnetic waves (6) and from which extends a tube (4) which ends in their emitting antenna (5). The electromagnetic waves (6) are emitted

towards the refined products (1). The emitting antenna (5) may constitute an integral part of the emitting device (3) or be connected to it with a tube (4).

The electromechanical or electronic device (3) produces electromagnetic waves (6) which cover wide wavelength ranges, from 1mm to 11.000km, together with their harmonic frequencies, which are produced by the device and which are emitted either in all the wavelengths from 1mm to 11.000km or in one or more parts of particular areas, so as to achieve a resonance of all the elements of the products of crude oil. The areas of the frequencies to which these electromagnetic waves belong are characterized by the international names EHL (extremely high frequencies), SHF (super high frequencies), UHF (ultra high frquencies), VHF (very high frequencies), HF (high frequencies), MF (medium frequencies), LF (low frequencies), VLF (very low frequencies). The emission of the electromagnetic waves (6) is programmed with the electromechanical or electronic circuit of the device (3) so as not to be continuous but pulsatory. The length between the emitted pulses may be of constant or variable time. The length between the pauses of the emitted pulses may be of constant or variable time.

The emission of the electromagnetic waves (6) may be modulated in any way, or it may not be modulated at all.

The emission potency of the electromagnetic waves (6) increases with each augmentative alteration of the distance between the source of the emission (5) of the electromagnetic waves (6) and the products of crude oil (1), or even with each augmentative alteration of the volume of the products of crude oil (1), to which the method is applied, in order to achieve the same qualitative improvement at the same time, as well as the reverse. Also, with each augmentative alteration of the distance between the source of the emission (5) of the electromagnetic waves (6) and the products of crude oil (1), or even with each augmentative alteration of the volume of the products of crude oil (1), to which the method is applied, the

application duration time of the method must be increased in order to achieve the same qualitative improvement with the same potency, as well as the reverse.

Furthermore, there exists the possibility of electromagnetic waves (6) being emitted from more than one device, simultaneously, in the same place. The total simultaneous emission potency provided must always be low, in order to achieve the desired result, but without causing any substantial increase in the temperature of the products of crude oil to which the present method is applied, without the potency descending below 0.0001 mWatt, whether one device is used or more than one devices.

The user of the method is able to decrease the time required for the achievement of the selected level of qualitative improvement by increasing the total simultaneous emission potency provided by the electromagnetic waves (6), which must be maintained in low levels, so as not to cause a substantial increase in the temperature of the products of crude oil, as well as the reverse, but without the emission potency descending below 0.0001 mWatt.

The initiation of the qualitative improvement of the products of crude oil occurs with the initiation of the application of the method, while the required application time for the occurance of a substantial improvement is short, not more than a few hours.

The duration period of the application of the method is dependent on the type of the products of crude oil to which the method is applied and is proportional to the desirable qualitative result. Thus, the longer the duration period of the application of the method the greater the qualitative improvement of the products of crude oil to which the method is applied.

Also, the method may be applied even if between the source of the pulsatory emission of electromagnetic waves and the products of crude oil there exist materials such as cardboard, wooden boxes, concrete and metals, with the exception of conductible materials which are grounded.

The present method can be widely used by industries and commercial enterprises of crude oil, as well as gas stations, and it can also be applied even to the final products of crude oil during their storage in the places they are customarily stored (like reservoirs). Also, the method can be applied to the products of crude oil even after their packaging in the form and the materials they are customarily packaged (such as barrels, drums, boxes and containers of drums, etc.). Finally, the method can be applied to the products of crude oil during their ground, marine or air transportation, as the proper application of the method does not require that the products be stationary.

The method results in a substantial qualitative improvement of the products of crude oil, as it counters the toxic substances they have and contains their toxic action, thus achieving a significant qualitative improvement of the products of crude oil, so that the final product which reaches the consumer and is used by him is less toxic and less polluting to the environment.

CLAIMS

1. A method of qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted towards the products of crude oil (1), which method is characterized by the fact that the emission of the electromagnetic waves (6) towards the products of crude oil (1) is programmed through an electromechanic or electronic device circuit (3), so that it is not continuous but pulsatory.

2. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claim 1, which is characterized by the fact that the programmed pulsatory emission of the electromagnetic waves (6), towards the products of crude oil (1), has small time pauses of variable length or not of their emission signal and by the fact that both the duration time between the emitted pulses and the duration time between their pauses may be of constant or variable time.

3. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1 and 2.

which is characterized by the fact that the electromagnetic waves (6), which are emitted pulsatorily towards the products of crude oil (1), cover wide ranges of wavelengths from 1mm to 11.000 km, together with their harmonic frequencies, which are produced by the device and emitted either at all the wavelengths from 1 mm to 11.000 km or at one or more parts of particular areas, so as to achieve a resonance of all the elements of the products of crude oil.

4. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2 and 3, which is characterized by the fact that the frequence ranges to which these electromagnetic waves belong are by the international names EHL (extremely high frequencies), SHF (super high frequencies), UHF (ultra high frquencies), VHF (very high frequencies), HF (high frequencies), MF (medium frequencies), LF (low frequencies), VLF (very low frequencies).

5. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3 and 4, which is characterized by the fact that the pulsatory emission of the

electromagnetic waves (6) may be modulated in any way, or it may not be modulated at all.

6. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3, 4 and 5, which is characterized by the fact that for its application a device with an emitting antenna may be used, which can be submerged inside the products of crude oil, or not, and by the fact that the emitting antenna (5) may constitute an integral part of the emitting device (3), or be connected to it with a tube (4), as well as by the fact that during the application of the method it is possible to move the products of crude oil (1) or even the device used for its application (3).

7. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3, 4, 5 and 6, which is characterized by the fact that the emission potency of the electromagnetic waves (6) must be increased with each augmentative alteration of the distance between the source of the emission (5) of the electromagnetic waves (6) and the products of crude oil (1), or even with each augmentative alteration of the volume of the industrial products of crude oil (1), to which the method is

applied, in order to achieve the same qualitative improvement at the same time, as well as the reverse.

8. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3, 4, 5, and 7, which is characterized by the fact that with each augmentative alteration of the distance between the source of the emission (5) of the electromagnetic waves (6) and the products of crude oil (1), or even with each augmentative alteration of the volume of the products of crude oil (1), to which the method is applied, the application duration time of the method must be increased in order to achieve the same qualitative improvement with the same potency, as well as the reverse.

9. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3, 4, 5, 7 and 8, which is characterized by the fact that the application of the method can also be achieved with the pulsatory emission of electromagnetic waves (6) from more than one device, simultaneously, in the same place, which have been programmed to emit electromagnetic waves of the same or different potency, and by the fact that the total simultaneous emission potency provided must always be low, in order to achieve the desired result, without causing any substantial increase in the temperature of the products of crude oil to which the present method is applied.

without the potency descending below 0.0001 mWatt, whether one device is used or more than one devices.

10. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3, 4, 5, 7, 8 and 9, which is characterized by the fact that the user of the method is able to decrease the time required for the achievement of the selected level of qualitative improvement by increasing the total simultaneous emission potency provided by the electromagnetic waves (6), which must be maintained in low levels, so as not to cause a substantial increase in the temperature of the products of crude oil, as well as the reverse, but without the emission potency descending below 0.0001 mWatt.

11. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claims 1, 2, 3, 4, 5, 7, 8, 9 and 10, which is characterized by the fact that the initiation of the qualitative improvement of the products of crude oil occurs with the initiation of the application of the method and is short, a few hours only, and by the fact that the duration period of the application of the method is dependent on the type of the products of crude oil to which the method is applied, as well as by the fact that the duration time of the application of the method is proportional to the desirable

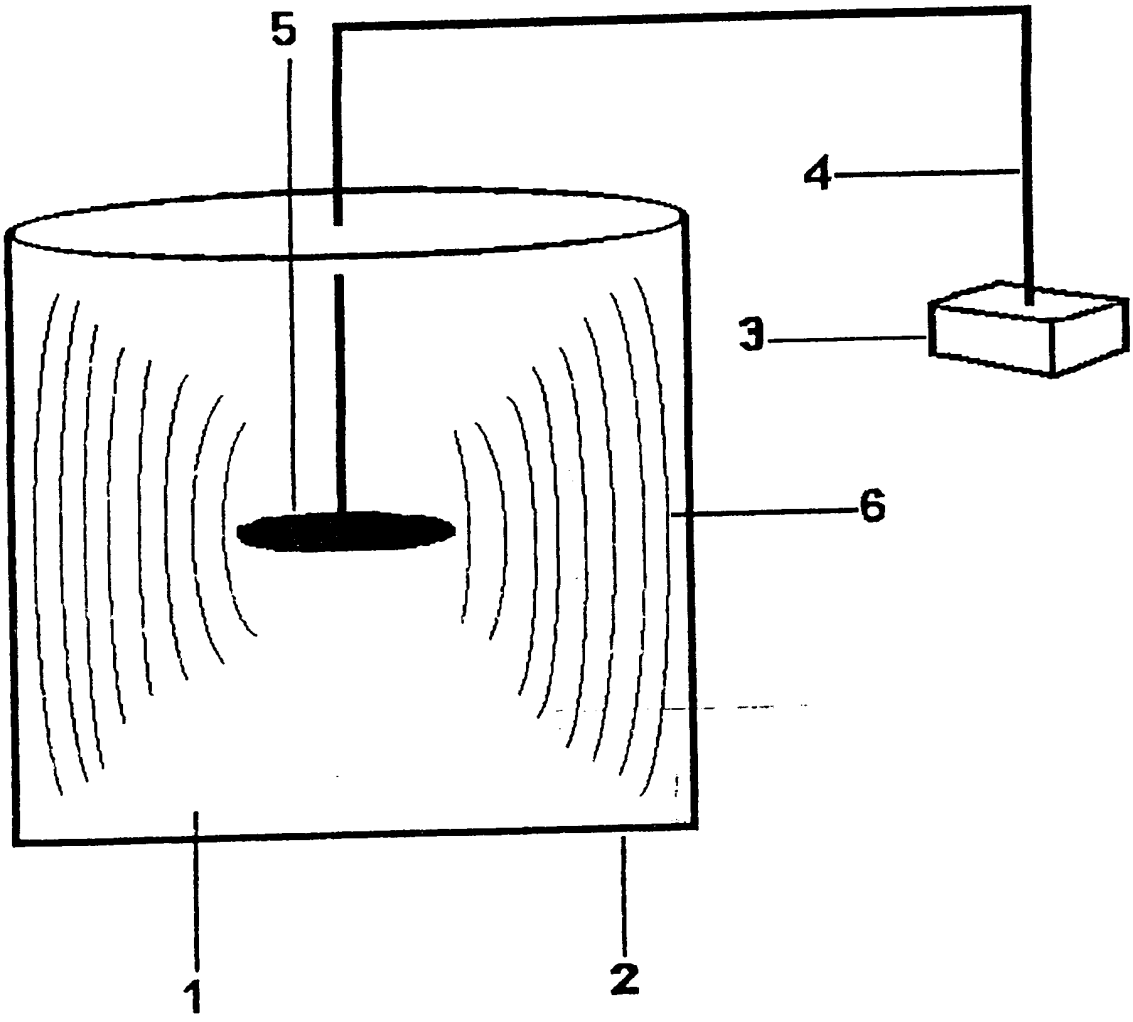
qualitative result, so that the longer the duration period of the application of the method the greater the qualitative improvement of the products of crude oil to which the method is applied.

12. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claim 1, which is characterized by the fact that it can be applied to all products of crude oil regardless of its quality, that is, to the products which are sent directly from the refineries to the final user, as well as to the products which after their production in the refineries are forwarded to processing industries for further processing, and to the products which having been processed by the processing industries are forwarded to the final user.

13. A method for the qualitative improvement of the products of crude oil (1), through the use of electromagnetic waves (6), which cover wide ranges of wavelengths, which are produced by electromechanical or electronic devices (3), the emission of which is pre-programmed, its potency is controlled, has a controlled application time and a controlled qualitative result, which are emitted pulsatorily towards the products of crude oil (1), according to claim 1, which is characterized by the fact that the method can also be applied even when the products or the devices required for its application are not stationary, as well as by the fact that it can be applied even if between the emission source of the pulsatory electromagnetic waves and the products of crude oil there exist materials of any kind, conductible or not, with the exception of conductible materials which are grounded, and therefore the method can have a wide application in industries and

commercial enterprises of crude oil, in gas stations, in the final products of crude oil during their storage in their customary areas, in the packaged products in the form and the materials they are customarily packaged, as well as, finally, in the products of crude oil during their ground, marine or air transportation.

Drawing 1



INTERNATIONAL SEARCH REPORT

International Application No
[redacted]GR 00/00013

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C10G32/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C10G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 625 178 A (ROJEY ALEXANDRE) 29 April 1997 (1997-04-29) the whole document	1-13
A	EP 0 435 590 A (EXXON RESEARCH ENGINEERING CO) 3 July 1991 (1991-07-03) the whole document	1-13
A	US 5 055 180 A (KLAILA WILLIAM J) 8 October 1991 (1991-10-08) the whole document	1-13
P,A	WO 00 11135 A (NIKOLAOU ATHANASIOS) 2 March 2000 (2000-03-02) the whole document	1-13

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 May 2000	17/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Michiels, P

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

[redacted]ation on patent family members

[redacted]onal Application No
[redacted]GR 00/00013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5625178 A	29-04-1997	FR 2726485 A	10-05-1996
		BR 9505123 A	09-09-1997
		CA 2162325 A	09-05-1996
		GB 2294885 A,B	15-05-1996
		IT MI952295 A	08-05-1996
		NL 1001588 C	12-09-1996
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		NO 954470 A	09-05-1996
EP 0435590 A	03-07-1991	US 5181998 A	26-01-1993
		CA 2031958 A	28-06-1991
		JP 3291244 A	20-12-1991
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		AU 586820 B	27-07-1989
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		BR 8506617 A	15-04-1986
		CA 1261735 A	26-09-1989
		DE 3584819 A	16-01-1992
		EP 0180619 A	14-05-1986
		EP 0307003 A	15-03-1989
		JP 61501931 T	04-09-1986
		KR 8903463 B	21-09-1989
		MX 159060 A	13-04-1989
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		NO 864025 A	13-02-1986
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		WO 8504893 A	07-11-1985
		ZA 8502948 A	24-12-1985
WO 0011135 A	02-03-2000	EP 0987323 A	22-03-2000

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
PANAGIOTIDOU		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GR00/00013	07/03/2000	09/11/1999
International Patent Classification (IPC) or national classification and IPC C10G32/02		
Applicant NIKOLAOU ATHANASIOS OF PANAGIOTIS		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

 ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

 - I ☒ Basis of the report
 - II ☐ Priority
 - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☒ Certain observations on the international application

CORRECTED VERSION

Date of submission of the demand	Date of completion of this report
12/04/2001	05.02.2002
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Pielka, I Telephone No. +49 89 2399 8357

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GR00/00013

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-7	as originally filed				

Claims, No.:

1-13	as received on	12/11/2001	with letter of	12/11/2001	

Drawings, sheets:

1/1	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

 These elements were available or furnished to this Authority in the following language: , which is:

 ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
 ☐ the language of publication of the international application (under Rule 48.3(b)).
 ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

 ☐ contained in the international application in written form.
 ☐ filed together with the international application in computer readable form.
 ☐ furnished subsequently to this Authority in written form.
 ☐ furnished subsequently to this Authority in computer readable form.
 ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

 ☐ the description, pages:
 ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)
see separate sheet

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 2-10,12-13.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 2-10, 12-13 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims

	No:	Claims	1-13
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-13
Industrial applicability (IA)	Yes:	Claims	1-13
	No:	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Re Item I

Basis of the report

1. The new features of amended claims 1 to 5 have no support in the application as filed so that they constitute added subject-matter. For example in claim 1 the expression "comprising its chronic interruption and/or change of its power output from maximum to zero" has no basis in the application as filed. Similarly in claim 2 the expression "symmetrical and/or asymmetrical" has no basis. In claim 3 the features of time ranges such a 1 picosecond to 20 seconds have no basis. In claims 4 and 5 the range of 30 Hz to 300 GHz has no basis.
 The claims 1 to 5 do not meet the requirements of **Article 19(2) PCT**.

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The subject-matter of the dependent claims 2 to 13 is drafted in such broad terms that no technical limitation can be ascertained. For example, in claim 2 the expression "symmetrical and/or asymmetrical" leaves entirely open what is expected. Similarly in claims 6 and 7 "predetermined and/or not determined" leaves it entirely open as to what is being claimed. Thus it is unclear what subject-matter is being claimed since nothing is defined.
 In claim 13 the claim relates to the use of a method. This is unclear as a use claim is in its strictest sense is in fact a method claim.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Novelty

1. Claim 1 relates to a method of qualitative improvement of the refined products of crude oil through the use of electromagnetic waves, whereby the electromagnetic radiation is pulsed.

 The expression "qualitative improvement" is considered to be vague and unclear so that no technical limitation can be inferred from this expression. The expression "to reduce the harmful biological consequences.." is a desired result and

introduces no limitation.

The claimed subject-matter is not novel in view of the following document cited in the Search Report, notably; EP-A-0 435 590, or D2.
D2 discloses the upgrading of hydrocarbons such as crude oil and its products using electromagnetic radiation which is pulsed microwave energy (see claims 1 and 12 as well as column 2, lines 30 to 34).

Thus claim 1 does not meet the requirements of **Article 33(2) PCT**.

2. Claims 2 to 13 depend on claim 1 which does not meet the requirements of **Article 33(2) PCT** so that dependent claims 2 to 13 also do not meet the requirements of **Article 33(2) PCT**.

Inventive Step

1. The claimed subject-matter does not appear to involve an inventive step as it is not apparent from the description what problem is solved, there being no experimental evidence which shows that any "qualitative improvement", whatever that may be, is achieved.
The claims 1 to 13 do not meet the requirements of **Article 33(3) PCT**.

Re Item VIII

Certain observations on the international application

1. The application is considered to be unclear so that the requirements of **Articles 5 and 6 PCT** are not met.

The application is directed to the reduction of the harmful effects caused by the use of crude oil and its products to the environment. The crude oil product are not in any way defined so that any possible product is encompassed within the teaching of the application. It is not taught which electromagnetic radiation or which wavelength is suitable for which products. Considering the plethora of possible products, for example ethylene, gasoline and plastics, the application does not provide any technical information which could instruct the reader how to perform the method. The application contains no examples and no technical data how to carry out the alleged invention. The use of terms such as "qualitative

improvement", which are so broad and undefined, means that it is unclear what the application aims to achieve.

2. As already indicated above under Item (V), the subject-matter of the dependent claims is considered to be unclear owing to the expressions "and/or".

CLAIMS

1. A method of qualitative improvement of the refined products of crude oil (1), through the use of electromagnetic waves (6), to reduce the harmful biological consequences of the use of these products, characterized by the fact, that the volume of the refined products of crude oil (1) receives electromagnetic energy from a synthetic electromagnetic emission covering wide ranges of frequencies, comprising a determined and/or not determined multitude of independent electromagnetic waves emissions (6) of different attribute frequency value, and is produced by electronic and/or electromechanical devices (3), each independent emission and/or the synthetic emission as a whole operating non-continuously, but in a way comprising its chronic interruption and/or the change of its power output from maximum to zero using any form of pulses.

2. A method according to claim 1, characterized by the fact, that each independent emission of electromagnetic waves with attribute frequency values and/or the synthetic emission, which in its entirety consists of a multitude of emissions of electromagnetic waves with different attribute frequency value (6), operates with symmetrical and/or asymmetrical duration of interruption and operation time and with any kind of composition of symmetrical and/or asymmetrical duration of interruption and operation time and any form of pulse for periodical power output change of each independent and/or synthetic emission.

3. A method according to claims 1 and 2, characterized by the fact, that the interruption duration of each independent and/or the synthetic emission may have any value from 1 picosecond to 20 seconds, preferably 1 μsec to 2 seconds at the most, and the duration of operation of each independent and/or the synthetic emission may have any value from 1 femptosecond to 5 seconds, preferably 1 μsec to 0,5 seconds at the most.

4. A method according to claims 1, 2 and 3, characterized by the fact, that the independent emissions of different frequencies of electromagnetic waves (6) have each different and/or the same power and cover a wide range or ranges or the entire widest range of electromagnetic spectrum frequencies from 30 Hz up to 300 GHz, so that the emitted impulse excitation activity of each independent electromagnetic waves emission with attribute frequency value coincides suitably with the natural pulsing frequency of each atomic and/or molecular system of the refined products of crude oil elements creating resonance circumstance.

5. A method according to claims 1 to 4, characterized by the fact, that independent emissions of different electromagnetic waves frequencies (6), with any attribute frequency value created in the widest range of electromagnetic spectrum frequencies from 30 Hz up to 300 GHz, are emitted towards the volume of the refined products of crude oil (1), preferably in the wide range of electromagnetic spectrum frequencies from 30 Hz up to 50 GHz.

6. A method according to claims 1 to 5, characterized by the fact, that appliance of the method is carried out by at least one device emitting a predetermined and/or not determined multitude of independent emissions of different electromagnetic waves frequencies (6) when in operation.

7. A method according to claims 1 to 5, characterized by the fact, that appliance of the method is carried out by more than one devices emitting each a predetermined and/or not determined multitude of independent emissions of different electromagnetic waves frequencies (6) when in operation, wherein each device emitts a predetermined and/or not determined multitude of electromagnetic waves (6) emissions

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of essentially different and/or essentially identical frequencies as the other devices.

8. A method according to claims 1 to 7, characterized by the fact, that the synthetic emission consisting of a multitude of independent emissions of different electromagnetic waves frequencies (6) of different and/or identical frequencies as a total as well as each independent emission of electromagnetic waves with specific attribute frequency value may be also modulated by any kind of modulating type.

9. A method according to claims 1 to 8, characterized by the fact, that it is also applied by the essentially simultaneous or not operation of more than one devices emitting a predetermined and/or not determined multitude of independent electromagnetic waves (6) emissions of different frequencies in the same place, where each one emitts electromagnetic energy of the same and/or different power.

10. A method according to claims 1 to 9, characterized by the fact, that the total of power emitted towards the refined products of crude oil (1) must bring about the desired result remaining at low levels, so that no significant increase of temperature occurs in the refined products of crude oil to which the method is applied, either by using one or more devices.

11. A method according to claims 1 to 10, characterized by the fact, that the duration of its application depends on the kind of refined products of crude oil (1) on which it is applied, and that the duration of said application is in proportion to the desired qualitative improvement, so that the longer the duration of application the greater the qualitative improvement of the refined products of crude oil on which application takes place.

AMENDED SHEET

12. A method according to claims 1 to 11, characterized by the fact, that it is applied to the final refined products of crude oil or not (1), which may be either at some stage of production, or after completion of their production, or while storage and with any way or material of packaging, even if any material is interposed between the electromagnetic energy emission source and the refined products of crude oil with the exception of conductible materials which are grounded.

13. The use of the method according to claims 1 to 12, characterized by the fact, that it can be used broadly in industry, manufacturing and commercial enterprises of refined products of crude oil production and/or distribution and resell.

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PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:
PANAGIOTIDOU, Effimia
Mitropoleos 41
546 23 Thessaloniki
GREECE

Date of mailing *(day/month/year)* 17/05/2000	
Applicant's or agent's file reference PANAGIOTIDOU	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/GR 00/ 00013	International filing date *(day/month/year)* 07/03/2000
Applicant NIKOLAOU ATHANASIOS OF PANAGIOTIS	

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Fascimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. [] The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [] **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

[] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

[] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Patrick Gehl

Form PCT/ISA/220 (July 1998)

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

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The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

(i) the claim is unchanged,

(ii) the claim is cancelled,

(iii) the claim is new,

(iv) the claim replaces one or more claims as filed,

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1 [Where originally there were 48 claims and after amendment of some claims there are 51]
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers, claims 30, 33 and 36 unchanged, new claims 49 to 51 added."

2 [Where originally there were 15 claims and after amendment of all claims there are 11]
"Claims 1 to 15 replaced by amended claims 1 to 11."

3 [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]
"Claims 1 to 6 and 14 unchanged, claims 7 to 13 cancelled, new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled, new claims 15, 16 and 17 added, all other claims unchanged."

4 [Where various kinds of amendments are made]
"Claims 1-10 unchanged, claims 11 to 13, 18 and 19 cancelled, claims 14, 15 and 16 replaced by amended claim 14, claim 17 subdivided into amended claims 15, 16 and 17, new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1))

The statement will be published with the international application and the amended claims.

It must be in the language in which the international appplication is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

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ENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
PANAGIOTIDOU		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GR 00/ 00013	07/03/2000	09/11/1999
Applicant		
NIKOLAOU ATHANASIOS OF PANAGIOTIS		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

 a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

 [] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

 b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

 [] contained in the international application in written form.

 [] filed together with the international application in computer readable form.

 [] furnished subsequently to this Authority in written form.

 [] furnished subsequently to this Authority in computer readble form.

 [] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

 [] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [] **Certain claims were found unsearchable** (See Box I).

3. [] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

 [X] the text is approved as submitted by the applicant.

 [] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

 [X] the text is approved as submitted by the applicant.

 [] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

 [] None of the figures.

 [X] as suggested by the applicant.

 [] because the applicant failed to suggest a figure.

 [] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

[redacted] International Application No
PC[redacted]R 00/00013

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C10G32/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C10G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 625 178 A (ROJEY ALEXANDRE) 29 April 1997 (1997-04-29) the whole document	1-13
A	EP 0 435 590 A (EXXON RESEARCH ENGINEERING CO) 3 July 1991 (1991-07-03) the whole document	1-13
A	US 5 055 180 A (KLAILA WILLIAM J) 8 October 1991 (1991-10-08) the whole document	1-13
P,A	WO 00 11135 A (NIKOLAOU ATHANASIOS) 2 March 2000 (2000-03-02) the whole document	1-13

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 May 2000	17/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Michiels, P

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/GR 00/00013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5625178 A	29-04-1997	FR 2726485 A	10-05-1996
		BR 9505123 A	09-09-1997
		CA 2162325 A	09-05-1996
		GB 2294885 A,B	15-05-1996
		IT MI952295 A	08-05-1996
		NL 1001588 C	12-09-1996
		NL 1001588 A	11-07-1996
		NO 954470 A	09-05-1996
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		CA 2031958 A	28-06-1991
		JP 3291244 A	20-12-1991
		US 5328577 A	12-07-1994
US 5055180 A	08-10-1991	AT 70079 T	15-12-1991
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		AU 4237485 A	15-11-1985
		BR 8506617 A	15-04-1986
		CA 1261735 A	26-09-1989
		DE 3584819 A	16-01-1992
		EP 0180619 A	14-05-1986
		EP 0307003 A	15-03-1989
		JP 61501931 T	04-09-1986
		KR 8903463 B	21-09-1989
		MX 159060 A	13-04-1989
		NO 855178 A	13-02-1986
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		NO 864024 A	13-02-1986
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		WO 8504893 A	07-11-1985
		ZA 8502948 A	24-12-1985
WO 0011135 A	02-03-2000	EP 0987323 A	22-03-2000

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Search Report

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